

## **I. LISTING OF PENDING CLAIMS:**

1-76. (*Canceled*)

77. (*Previously presented*)                      A combination of a chemical mechanical polishing composition in contact with a substrate surface having at least one feature thereon comprising a noble metal, said combination comprising:

                    a substrate comprising submicron integrated circuits and having a surface-having at least one feature thereon comprising a noble metal;

                    said substrate surface contacting a chemical mechanical polishing composition comprising: periodic acid and an abrasive in a combined amount sufficient to render the substrate surface substantially planar and to maintain a polishing rate of between 300 Angstroms per minute to about 2000 Angstroms per minute upon chemical-mechanical polishing thereof, wherein periodic acid is in an amount from about 0.05 to about 0.3 moles/kilogram.

78. (*Previously presented*)                      The combination of claim 77, wherein periodic acid is in an amount from about 0.075 to about 0.3 moles/kilogram.

79. (*Previously presented*)                      The combination of claim 77, wherein periodic acid is in an amount from about 0.075 to about 0.175 moles/kilogram.

80. (*Previously presented*)                      The combination of claim 77, wherein the abrasive is in an amount from about 0.2 to about 6 weight percent.

81. (*Previously presented*)                      The combination of claim 77, wherein the abrasive is in an amount from about 0.2 to about 4 weight percent.

82. (*Previously presented*)                      The combination of claim 77, further comprising a pH-adjusting agent, wherein the pH is from about pH 5 to about pH 10.

83. (*Previously presented*)                      The combination of claim 77, further comprising a pH-adjusting agent, wherein the pH is from about pH 1 to about pH 4.
84. (*Previously presented*)                      The combination of claim 83, wherein the composition consists essentially of water, periodic acid, an abrasive, and a pH-adjusting agent is selected from a group consisting of a quaternary amine, an inorganic base, and any combination thereof.
85. (*Previously presented*)                      The combination of claim 83, wherein the pH-adjusting agent comprises an agent selected from a group consisting of tetramethylammonium hydroxide, ammonium hydroxide, potassium hydroxide, sodium hydroxide, and any combination thereof.
86. (*Previously presented*)                      The combination of claim 77, further comprising a suspension agent.
87. (*Previously presented*)                      The combination of claim 86, wherein the suspension agent comprises an agent is selected from a group consisting of an organic acid, a surfactant, another abrasive, and ethyl carbonate.
88. (*Previously presented*)                      The combination of claim 77, wherein the abrasive comprises an abrasive having a Mohs hardness number of greater than about 6.5.
89. (*Previously presented*)                      The combination of claim 77, wherein the abrasive comprises an abrasive selected from a group consisting of alumina, silica, zirconia, spinel, zirconium nitride, and any combination thereof
90. (*Previously presented*)                      The combination of any one of claims 77 through 86, wherein the abrasive comprises alumina.
91. (*Previously presented*)                      The combination of any one of claims 77 through 86, wherein the feature comprises a material selected from a group consisting of Ir, IrO<sub>2</sub>, Pt, and any combination thereof.

92. (*Previously presented*)                      The combination of claim 77, wherein said combined amount is sufficient to provide the substrate surface with a WWNU of less than about 12% upon polishing of the substrate surface with the composition.

93. (*Previously presented*)                      The combination of claim 77, wherein said combined amount is sufficient to provide the substrate surface with a WTWNU of less than about 5%.

94. (*Previously presented*)                      A combination of a chemical mechanical polishing composition in contact with a substrate surface having at least one feature thereon comprising a noble metal, comprising:

                    a substrate having a surface, wherein said surface a dielectric material and has at least one feature thereon comprising a noble metal, and wherein said surface is contacting a composition comprising:

                    periodic acid in an amount from about 0.05 to about 0.3 moles/kilogram; and

                    an abrasive in an amount from about 0.2 to about 6 weight percent, said composition having a pH from above pH 5 to about pH 10;

                    and wherein on polishing the substrate surface with the composition contacting the surface the selectivity of the composition for polishing the noble metal-containing material over polishing the dielectric material is at least 1:1.

95. (*Previously presented*)                      The combination of claim 94, wherein the amount of periodic acid is from about 0.075 to about 0.3 moles/kilogram.

96. (*Previously presented*)                      The combination of claim 94, wherein the amount of periodic acid is from about 0.075 to about 0.175 moles/kilogram

97. (*Previously presented*)                      The combination of claim 94, wherein the amount of the abrasive is from about 0.2 to about 4 weight percent.

98. (*Previously presented*)                      The combination of claim 94, wherein the pH is from about pH 6 to about pH 10.

99. (*Previously presented*)                      The combination of claim 94, further comprising a pH-adjusting agent.
100. (*Previously presented*)                      The combination of claim 99, wherein the pH-adjusting is selected from a group consisting of a quaternary amine, an inorganic base, and any combination thereof.
101. (*Previously presented*)                      The combination of claim 99, wherein the pH-adjusting agent comprises an agent selected from a group consisting of tetramethylammonium hydroxide, ammonium hydroxide, potassium hydroxide, sodium hydroxide, and any combination thereof.
102. (*Previously presented*)                      The combination of claim 94, further comprising a suspension agent.
103. (*Previously presented*)                      The combination of claim 102, wherein the suspension agent comprises an agent selected from a group consisting of an organic acid, a surfactant, another abrasive, and ethyl carbonate.
104. (*Previously presented*)                      The combination of claim 94, wherein the abrasive comprises an abrasive having a Mohs hardness number of greater than about 6.5.
105. (*Previously presented*)                      The combination of claim 94, wherein the abrasive comprises an abrasive selected from a group consisting of alumina, silica, zirconia, spinel, zirconium nitride, and any combination thereof.
106. (*Previously presented*)                      The combination of any one of claims 94 through 102, wherein the abrasive comprises alumina.
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108. *(Previously presented)* The combination of claim 94, wherein said composition provides the substrate surface with a WTWNU of less than about 5% upon chemical-mechanical polishing thereof.

109. *(Previously presented)* The combination of claim 94 wherein the feature comprises Ir.

110. *(Previously presented)* The combination of claim 94, wherein the feature comprises IrO<sub>2</sub>.

111. *(Previously presented)* The combination of claim 94, wherein the feature comprises platinum.

112. *(Previously presented)* A combination of a composition in contact with a substrate surface having at least one feature thereon comprising a noble metal, comprising:

A) a composition consisting essentially of:

1) water;

2) periodic acid in an amount from about 0.05 to about 0.3 moles/kilogram;

3) a first alumina abrasive in an amount from about 0.2 to about 6 weight percent;

4) optionally, a pH-adjusting agent in an amount sufficient to cause the pH of the slurry to be between about 1 to about 4 or between about 5 to about 10;

5) optionally, a suspension agent;

wherein said composition is contacting

B) a substrate surface having at least one feature thereon comprising a noble metal.

113. *(Previously presented)* The combination of claim 112 wherein the composition includes at least one pH-adjusting agent selected from a group consisting of a quaternary amine, an inorganic base, and any combination thereof.

114. *(Previously presented)* The combination of claim 112, wherein the composition consists essentially of:

- 1) water;
- 2) periodic acid in an amount from about 0.05 to about 0.3 moles/kilogram;
- 3) an alumina abrasive in an amount from about 0.2 to about 6 weight percent; and
- 4) a pH-adjusting agent in an amount sufficient to cause the pH of the slurry to be between about 1 to about 4 or between about 5 to about 10.

115. *(Previously presented)* The combination of claim 114, wherein the pH of the slurry is between about 1 to about 4.

116. *(Previously presented)* The combination of claim 114, wherein the pH of the slurry is between about 5 to about 10.

117. *(Previously presented)* The combination of claim 112, wherein the composition includes at least one suspension agent is selected from a group consisting of an organic acid, a surfactant, another abrasive, and ethyl carbonate.

118. *(Previously presented)* The combination of claim 112, wherein the composition consists essentially of:

- 1) water;
  - 2) periodic acid in an amount from about 0.05 to about 0.3 moles/kilogram;
  - 3) an alumina abrasive in an amount from about 0.2 to about 6 weight percent; and
  - 4) optionally a pH-adjusting agent in an amount sufficient to cause the pH of the slurry to be between about 1 to about 4 or between about 5 to about 10
- and
- 5) a suspension agent.

119. *(Previously presented)* The combination of claim 118, wherein the suspension agent is an organic acid.

120. *(Previously presented)* The combination of claim 118, wherein the suspension agent is a surfactant.
121. *(Previously presented)* The combination of claim 118, wherein the suspension agent is ethyl carbonate.
122. *(Previously presented)* The combination of claim 118, wherein the suspension agent is a material having a CAS number of CAS#1344-28-1.
123. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises a hydrous sodium lithium magnesium silicate.
124. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises ammonium polymethacrylate.
125. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises colloidal silica.
126. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises a surfactant.
127. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises an organic acid.
128. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises succinic acid.
129. *(Previously presented)* The combination of claim 118, wherein the suspension agent comprises a second abrasive different from the first abrasive.
130. *(Previously presented)* The combination of claim 112, wherein the feature comprises Ir.

131. (*Previously presented*)      The combination of claim 112, wherein the feature comprises IrO<sub>2</sub>.
132. (*Previously presented*)      The combination of claim 112, wherein the feature comprises platinum.
133. (*Previously presented*)      The combination of claim 112, wherein the feature comprises gold.
134. (*Previously presented*)      The combination of claim 112, wherein the feature comprises silver.
135. (*Previously presented*)      The combination of claim 112, wherein the first abrasive consists essentially of *alpha*-alumina.
136. (*Previously presented*)      The combination of claim 112, wherein the first abrasive consists essentially of *gamma*-alumina.
137. (*Previously presented*)      The combination of claim 112, wherein the first abrasive consists essentially of *alpha*-alumina and *gamma*-alumina.
138. (*Previously presented*)      The combination of claim 122, wherein the substrate further comprises a dielectric material, and wherein the selectivity of the composition for polishing the noble metal-containing material over polishing the dielectric material is at least 1:1.
139. (*Previously presented*)      The combination of claim 122, wherein the substrate further comprises a dielectric material, and wherein the selectivity of the composition for polishing the noble metal-containing material over polishing the dielectric material is about 1:1.